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(54) Title: PART-GEOMETRY INDEPENDANT REAL TIME CLOSED LOOP WELD POOL TEMPERATURE CONTROL SYSTEM FOR MULTI-LAYER DMD PROCESS

(57) Abstract: In a direct metal deposition system which builds up a metallic overlay on a substrate by moving the substrate relative to a laser in a metallic powder feed, the laser power is adjusted for successive layers by sensing the weld pool in a plurality of selected points in each layer and adjusting the power during successive layers to maintain a weld pool that corresponds to those achieved during deposition of a lower optimal layer. This compensates for heating of the substrate resulting from the deposition which tends to increase the pool size or temperature in the higher layers.



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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/27089

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B23K 26/00

US CL : 219/121.6

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## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 219/121.6, 121.61, 121.63, 121.64, 121.65, 121.66, 121.85

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
US OCR, US PAT, US PG, Derwent, JPO, EPO

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0166896 A1 (MAZUMDER) 10 January 2002 (abstract, [30, 34-38, 40, 61-62, 68-77])	1-13
X	US 2002/0165634 A1 (SKSZEK) 3 April 2002 (abstract, [20-28])	1-13
X	US 6,122,564 A (KOCK et al.) 19 September 2000 (abstract, figures 2-3, col. 2 lines 36-50, col. 3 lines 29-67, col. 4 lines 1-67, col. 5 lines 1-33, col. 6 lines 22-38)	1-13
Y	US 6,504,127 A (MCGREGOR et al.) 31 October 2000 (abstract, col. 4 lines 15-50, col. 6 lines 23-67, col. 7 lines 10-33)	1-13
Y	US 5,453,329 A (EVERETT et al.) 26 September 1995 (abstract, col. 2 lines 15-56)	1-13
Y	US 5,155,321 A (GRUBE et al.) 13 October 1992 (abstract, col. 5 lines 60-68)	1-13
Y	US 6,329,635 A (LEONG et al.) 11 December 2001 A (abstract, figures, col. 3 lines 1-14, col. 5 lines 60-67)	1-13
Y	US 6,455,803 A (FIELDS, JR et al.) 3 May 2000 (abstract)	1-13
Y	US 5,837,960 A (LEWIS et al.) 17 November 1998 (abstract, col. 3 lines 24-36, col. 4 lines 21-50)	1-13



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